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L5: Entry 4 of 19 File: USPT Jan 5, 1999

DOCUMENT-IDENTIFIER: US 5855805 A
TITLE: Microetching and cleaning of printed wiring boards

BSPR:
Alkali metal persulfates such as sodium persulfate (sodium peroxydisulfate) are known to provide a superior copper topography when used as microetchants and cleaners in PWB manufacture. The topography is characterized by a rougher metallurgical surface than results from use of other microetchants, thereby providing a sufficient number of keying sites to ensure good adhesion for plating, resist and lamination. The pH of the persulfate solution can be lowered and surface texture can be varied by the addition of a mineral acid to the solution; phosphoric acid produces a relatively smoother topography whereas sulfuric acid increases roughness. Typically, about 1-2 percent mineral acid by volume of persulfate solution is used. Persulfates also are effective at lower temperatures than other microetchants. For example, persulfates are effective at about 75.degree.-90.degree. F. whereas hydrogen peroxide/sulfuric acid solutions require temperatures of about 115.degree.-130.degree. F.

BSPR:
Surfactants useful in accordance with the above criteria of solubility, wettability and stability include nonionic, anionic, cationic and amphoteric surfactants. The preferred classes to date are the nonionics and cationics. Useful nonionics include fatty alcohol ethoxylates, alkyl phenol ethoxylates, fatty acid esters, fatty acid alkanolamides, and the like. Anionics include the primary and secondary alkyl sulphates derived from sulphation of C12-C18 and C8-C18 olefins, respectively; branched and linear alkylbenzene sulphonates; petroleum sulphonates, naphthenates and alkyl napththalene sulfphonates; phosphate esters; salicylates; sulphonated esters; various paraffin and olefin sulphonates; sulphosuccinates such as mono and di-alkyl sulphosuccinates; secondary alkane sulphonates; alcohol ether sulphates; alkylphenol ether sulfates; ethoxycarboxylates; and the like.